N-Serve Effects on Corn Production and Soil Nitrogen Availability

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Objective

To evaluate corn response to N-serve stabilized nitrogen and soil nitrogen availability with N-serve.

Background

Cooperator:	Carlton Meyeer	Herbicide:	Dual
County:	Henry	Variety:	Wellman 1560
Soil Type:	Hoytville clay loam	Planting Date:	May 10, 2001
Tillage:	Fall Strip Till	Planting Rate:	32,000 seeds/A
Previous Crop:	Soybeans	Harvest Date:	Novemeber 5, 2001

Methods

A field was set up to compare fall-applied NH3 with N-serve to fall-applied NH3 with no N-serve in three replications with a randomized complete block design. All other inputs were the same. Treatment plots were 800 feet long and 12 rows wide. Anhydrous ammonia was applied in the fall at a rate of 180 lb/A of actual N with N-serve plus dry fertilizer of 20-48-85 (N-P-K) with strip tillage in a single pass on November 5, 2000.

Soil samples were taken on March 30, May 4, and May 29 of 2001. Samples were taken at depths of 0 to 12 inches and 12 to 24 inches in areas with and without N-serve. A&L Laboratories, Fort Wayne, Ind., conducted the analysis. At corn maturity (black layer), corn stalk nitrate samples were taken and analysis conducted by A&L Lab. Eight inches of stalk segment located six inches above ground were taken from three random sites in each plot. The data reported here is the average of multiple replications. Yield data was based on the center six rows along the full length of each plot being combined using a yield monitor. Corn yields were adjusted to 15.5% moisture.

Results

Table 1. Soil Nitrate and Ammonium Levels at Two Soil Depths on Three Sampling Dates.

Sample Date	Nitrate (ppm NO3-N)				Ammonium (ppm NH4-N)			
	0-12 inch depth		12-24 inch depth		0-12 inch depth		12-24 inch depth	
	N-serve	No N-serve	N-serve	No N-serve	N-serve	No N-serve	N-serve	No N-serve
March 30, 2001	24	23.5	10	7.5	44	69.5	6	9
May 4, 2001	62.7	69.7	22.7	15.3	36	55	4	5
May 29, 2001	20	24	15.3	12.3	11	23	2.7	4
Average	35.6	39.1	16	11.7	30.3	49.2	4.2	6
LSD (0.05)	9.4		6.7		16.8		2.7	
CV (%)	7.1		13.7		12.1		14.9	

All of the above data were averages of multiple samplings of the replicates. There were wide variations of soil readings within many soil sample sites.

Table 2. Corn Stalk Nitrate and Yield.

Treatment	Stalk Nitrate (ppm)	Yield (bu/A)
N-serve	200	128.5
No N-serve	100	116.6
LSD (0.05)	430	17.6
CV (%)	81.6	4.1

Summary and Notes

Soil nitrogen testing was inconclusive because of wide variation within specific sample sites. Average ammonium levels were significantly higher for the No N-serve treatment in the top 12 inches. This does not follow the expected nitrification inhibiting benefits of N-serve. By inhibiting nitrification one would expect a reduction in the microbial conversion of ammonium to nitrate.

Excessive rainfall in mid-May resulted in less than adequate soil nitrogen levels on May 29. Lack of rainfall in August may have caused corn plants to cannibalize stalk nitrate nutrients, resulting in very low corn stalk nitrate levels by maturity. Corn yields were not significantly

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